UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/890,482	05/02/2003	Andrew J. Ouderkirk	53852US013	1699

32692 7590 01/25/2005

3M INNOVATIVE PROPERTIES COMPANY
PO BOX 33427
ST. PAUL, MN 55133-3427

EXAMINER	
BOUTSIKARIS, LEONIDAS	
ART UNIT	PAPER NUMBER
2872	

DATE MAILED: 01/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/890,482	OUDERKIRK ET AL.	
	Examiner	Art Unit	
	Leo Boutsikaris	2872	

-- The MAILING DATE of this communication appears on the cover sh et with the correspondenc address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 November 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *6-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *6-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 July 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *1/25; 1/29/02, 11/29/04, 1/10/05*
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 6-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arends (US 5,360,659) in view of Oi (US 5,804,102) and Isoda (US 3,928,760) and any of Van der Voort (US 4,937,661) or Vriens (US 4,804,884).

Regarding claim 6, Arends discloses an optical filter (Fig. 1) comprising a dielectric reflective layer capable of reflecting a predetermined proportion of light in a specific wavelength region, i.e., near infrared, while transmitting a predetermined proportion of light in a desired wavelength region, i.e., the visible region between 430 and 790 nm (see Fig. 3), the dielectric reflective layer comprising a first set of dielectric reflective layer units, constituted by a plurality of layers each formed of a first polymer A, in combination with a second set of dielectric reflective layer units constituted by a plurality of layers each formed of a second polymer B having a refractive index different from the first polymer, the first and second sets of dielectric reflective layer units being combined by alternatively stacking the first and second polymer layers, A and B, the dielectric reflective layer having a reflectance of not less than 70% of the

light to be reflected (wavelengths in the 1,200-2,000 nm region), and transmittance of no less than 60% in the visible region (lines 2-6, col. 4, and 4-10, col. 7).

However, Arends does not disclose the IR reflective filter is used in conjunction with an IR detector device and that the filter is curved.

Oi discloses a plasma display filter that cuts off passage of near IR radiation (see Abstract), and he teaches that near IR rays emitted by the plasma display devices affect electronic equipment located in the vicinity of the display, such as IR remote control devices (lines 22-26, col. 1). Such effect causes malfunctions to the IR sensors e.g., the remote control device. Furthermore, Isoda discloses a remote control device, which includes an optical filter 14 in front of the optical detector 15 (Fig. 3). The role of the optical filter is to prevent passage of light of unwanted wavelengths (in this case visible light, i.e., the filter only allows passage of IR light). It would have been obvious to one of ordinary skill in the art at the time the invention was made, to use the multilayer IR filter of Arrends, a filter which substantially reflects incident IR radiation, in conjunction with an IR remote control detector in order to prevent the incidence of unwanted IR radiation upon the detector and the resulting deleterious effects, as taught by Oi, by simple placing the filter in front of the detector, as taught by Isoda. Such simple arrangement would substantially prevent most of the IR radiation from being incident onto the remote control detector, thus preventing possible malfunction of the device (line 26, col. 1, in Oi).

Regarding the limitation that the filter is curved, Vriens (Fig. 3, lines 11-19, col. 6) and Van der Voort (Fig. 2b, lines 66-68, col. 2) disclose dielectric interference filters which are formed onto a curved substrate. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the IR reflective filter of Arends on a curved carrier, as

taught by Vriens and Van der Voort, since a curved-shaped filter provides a greater flexibility in covering the most possible sensor area. Furthermore, the nature of the interference filter of Arrends is such that it is easy to shape or form it into other forms, in other words it would be easy to shape it in a curved form (lines 24-26, col. 1 in Arrends).

Regarding claims 7, 10, the curved shape of the filter disclosed by is cylindrical, the detector is positioned behind the filter (see Fig. 3 in Isoda), and because of its shape, it provides a wide viewing angle in one plane (plane of paper) and limited in the orthogonal plane.

Regarding claim 8, Vriens and Van der Voort do not specify that the shape of the curved filter is spherical. It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the shape of the protective filter spherical, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ (CCPA 1980). Here, the effective variable is the shape of the protective filter, and a spherical-shaped filter substantially enclosing an IR sensor, provides the maximum protection against external interference for the case of omni-directional IR sensors.

Regarding claim 9, it is noted that the combination of Arends in view of Oi and Isoda and further in view of Vriens or Van der Voort reads on all of the limitations of the claim, since the claim language "to accommodate spectral shift" is functional language, and it has been held that claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. *In re Danley*, 120 USPQ 528, 531 (CCPA 1959). Furthermore, it has been held that "apparatus claims cover what a device is, not what a device does" (emphasis in original) *Hewlett-Packard Co. v. Bausch & Lomb Inc.*, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990).

Claims 11-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arrends (US 5,360,659) in view of Ouderkirk (WO 97/01778) and further in view of Lechter (US 5,101,139).

Regarding claims 11-12, Arends discloses all the limitations of the above claim except for showing a metallic mesh coated on the surface of the dielectric reflective film. Ouderkirk discloses a transparent multilayer filter comprising multiple polymeric layers, the filter reflecting IR light. In addition, the filter includes a transparent metallic conductor layer (see Abstract). It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a metallic layer in the IR reflecting filter of Arrends, as taught by Ouderkirk, in order to provide broader reflectivity than either a multilayered polymer film, or the transparent metallic conductor alone, with the former providing good near IR reflection, and the latter providing good far IR reflection (lines 5-15, p. 36 in Ouderkirk). Furthermore, the metallic conductor is coated on the dielectric filter by vapor deposition or sputtering (lines 9-11, p. 37 in Ouderkirk).

Regarding the limitation that the metallic layer is in the form of a mesh, Lechter discloses a flat panel display, which includes a metallic transparent mesh 19 juxtaposed on a filter layer assembly (Fig. 1, 6, and lines 55-58, col. 2 and 37-41, col. 6). It would have been obvious to one of ordinary skill in the art at the time the invention was made to form the metallic layer on the dielectric filter of Arends in the form of a mesh, as taught by Lechter, for the additional benefit (i.e., in addition to providing enhanced IR reflectivity) of inhibiting the passage of deleterious electric fields (see lines 6-9, col. 2).

Regarding claim 13, the dielectric multi-layer film is disposed on substrate 17 (see Fig. 1 in Arends).

Regarding claim 14, Arends teaches that the IR reflecting laminate filter may be disposed on glass substrate (lines 63-65, col. 1).

Regarding claim 15, Lechter discloses that the laminate optical filter used includes an AR coating on an end face (lines 51-54, col. 2).

Regarding claims 16, 19, Lechter discloses that the conductive metallic mesh is grounded (lines 38-39, col. 6), and Fig. 6 shows that the metallic mesh is in contact with the peripheral edges of the filter substrate.

Regarding claims 17-18, Lechter does not specify the type of the conductive, metallic mesh used in conjunction with the optical filter for shielding electric fields. It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the mesh from copper, since it has been held that to be within the general skill of a worker in the art to select a known material on the basis of its suitability for its intended use. *In re Leshin*, 125 USPQ 416. Copper has excellent conductive properties and it is reasonably economical.

Claims 20-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arends (US 5,360,659) in view of Ouderkirk (WO 97/01778), Lechter (US 5,101,139), and further in view of Oi (US 5,804,102).

Regarding claims 20-22, Arends discloses all the limitations of the above claim except for showing a metallic mesh coated on the surface of the dielectric reflective film. Ouderkirk discloses a transparent multilayer filter comprising multiple polymeric layers, the filter reflecting

IR light. In addition, the filter includes a transparent metallic conductor layer (see Abstract). It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a metallic layer in the IR reflecting filter of Arrends, as taught by Ouderkirk, in order to provide broader reflectivity than either a multilayered polymer film, or the transparent metallic conductor alone, with the former providing good near IR reflection, and the latter providing good far IR reflection (lines 37-42 in Ouderkirk). Furthermore, the metallic conductor is coated on the dielectric filter by vapor deposition or sputtering (lines 9-11, p. 37 in Ouderkirk).

Regarding the limitation that the metallic layer is in the form of a mesh, Lechter discloses a flat panel display, which includes a metallic transparent mesh 19 juxtaposed on a filter layer assembly (Fig. 1, 6, and lines 55-58, col. 2 and 37-41, col. 6). It would have been obvious to one of ordinary skill in the art at the time the invention was made to form the metallic layer on the dielectric filter of Arends in the form of a mesh, as taught by Lechter, for the additional benefit (i.e., in addition to providing enhanced IR reflectivity) of inhibiting the passage of deleterious electric fields (see lines 6-9, col. 2).

Finally, regarding the limitation that the above IR reflective filter is used in conjunction with a source that emits radiation in an undesired wavelength range, Oi discloses a plasma display filter that cuts off passage of near IR radiation (see Abstract), and in addition he teaches that near IR rays emitted by the plasma display devices affect electronic equipment located in the vicinity of the display, such as IR remote control devices (lines 22-26, col. 1). Such effect causes malfunctions to the IR sensors e.g., the remote control device. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the IR reflecting filter of

Arrends on a remote control device in conjunction with a plasma display device emitting unwanted IR radiation, as taught by Oi, in order to avoid malfunction of the remote control.

Regarding claim 23, the dielectric multi-layer film is disposed on substrate 17 (see Fig. 1 in Arends).

Regarding claim 24, Arends teaches that the IR reflecting laminate filter may be disposed on glass substrate (lines 63-65, col. 1).

Regarding claim 25, Lechter discloses that the laminate optical filter used includes an AR coating on an end face (lines 51-54, col. 2).

Regarding claims 26-27, Lechter discloses that the conductive metallic mesh is grounded (lines 38-39, col. 6), and Fig. 6 shows that the metallic mesh is in contact with the peripheral edges of the filter substrate.

Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ouderkirk (WO 97/01778) in view of Oi (US 5,804,102) and Isoda (US 3,928,760) and further in view of any of Van der Voort (US 4,937,661) or Vriens (US 4,804,884).

Ouderkirk discloses an optical filter (Fig. 1) comprising a dielectric reflective layer capable of reflecting a predetermined proportion of light in a specific wavelength region, i.e., near infrared, while transmitting a predetermined proportion of light in a desired wavelength region, i.e., the visible region (see Fig. 14), the dielectric reflective layer comprising a first set of dielectric reflective layer units, constituted by a plurality of layers each formed of a first polymer A, in combination with a second set of dielectric reflective layer units constituted by a plurality of layers each formed of a second polymer B having a refractive index different from the first

polymer, the first and second sets of dielectric reflective layer units being combined by alternatively stacking the first and second polymer layers, A and B, the dielectric reflective layer having a reflectance of not less than 70% of the light to be reflected (wavelengths in the 800-1,100 nm region). Furthermore, at least one of the polymer layers is birefringent (line 30, p. 4 to line 2, p. 5).

However, Ouderkirk does not disclose the IR reflective filter is used in conjunction with an IR detector device.

Oi discloses a plasma display filter that cuts off passage of near IR radiation (see Abstract), and he teaches that near IR rays emitted by the plasma display devices affect electronic equipment located in the vicinity of the display, such as IR remote control devices (lines 22-26, col. 1). Such effect causes malfunctions to the IR sensors e.g., the remote control device. Furthermore, Isoda discloses a remote control device, which includes an optical filter 14 in front of the optical detector 15 (Fig. 3). The role of the optical filter is to prevent passage of light of unwanted wavelengths (in this case visible light, i.e., the filter only allows passage of IR light). It would have been obvious to one of ordinary skill in the art at the time the invention was made, to use the multilayer IR filter of Ouderkirk, a filter which substantially reflects incident IR radiation, in conjunction with an IR remote control detector in order to prevent the incidence of unwanted IR radiation upon the detector and therefore cause deleterious effects, as taught by Oi, by simple placing the filter in front of the detector, as taught by Isoda. Such simple arrangement would substantially prevent most of the IR radiation from being incident onto the remote control detector, thus preventing possible malfunction of the device (line 26, in Oi).

Finally, Ouderkirk does not disclose that the filter is curved. As mentioned supra, Van der Voort and Vriens disclose interference filters that are formed on curved substrates. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the IR reflective filter of Ouderkirk on a curved carrier, as taught by Vriens and Van der Voort, since a curved-shaped filter provides a greater flexibility in covering the most possible sensor area.

Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ouderkirk (WO 97/01778) in view of Lechter (US 5,101,139).

Ouderkirk discloses all the limitations of the above claim including the limitation that the filter includes a transparent metallic conductor layer (see Abstract), and that the metallic layer is coated onto the dielectric filter (lines 9-13, p. 37). However, Ouderkirk does not teach that metallic layer is in the form of a mesh. Lechter discloses a flat panel display, which includes a metallic transparent mesh 19 juxtaposed on a filter layer assembly (Fig. 1, 6, and lines 55-58, col. 2 and 37-41, col. 6). It would have been obvious to one of ordinary skill in the art at the time the invention was made to form the metallic layer on the dielectric filter of Ouderkirk in the form of a mesh, as taught by Lechter, for the additional benefit (i.e., in addition to providing enhanced IR reflectivity) of inhibiting the passage of deleterious electric fields (see lines 6-9, col. 2).

Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ouderkirk (US 6,565,982) in view of Lechter (US 5,101,139), and Oi (US 5,804,102).

Ouderkirk discloses all the limitations of the above claim including the limitation that the filter includes a transparent metallic conductor layer (see Abstract) and that the metallic layer is

coated onto the dielectric filter (lines 9-13, p. 37). However, Ouderkirk does not teach that the metallic layer is in the form of a mesh. Lechter discloses a flat panel display, which includes a metallic transparent mesh 19 juxtaposed on a filter layer assembly (Fig. 1, 6, and lines 55-58, col. 2 and 37-41, col. 6). It would have been obvious to one of ordinary skill in the art at the time the invention was made to form the metallic layer on the dielectric filter of Ouderkirk in the form of a mesh, as taught by Lechter, for the additional benefit (i.e., in addition to providing enhanced IR reflectivity) of inhibiting the passage of deleterious electric fields (see lines 6-9, col. 2).

Finally, regarding the limitation that the above IR reflective filter is used in conjunction with a source that emits radiation in an undesired wavelength range, Oi discloses a plasma display filter that cuts off passage of near IR radiation (see Abstract), and in addition he teaches that near IR rays emitted by the plasma display devices affect electronic equipment located in the vicinity of the display, such as IR remote control devices (lines 22-26, col. 1). Such effect causes malfunctions to the IR sensors e.g., the remote control device. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the IR reflecting filter of Ouderkirk on a remote control device in conjunction with a plasma display device emitting unwanted IR radiation, as taught by Oi, in order to avoid malfunction of the remote control.

Response to Arguments

Applicant's arguments with respect to claims 6-30 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Leo Boutsikaris whose telephone number is 571-272-2308.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Leo Boutsikaris, Ph.D.
Primary Patent Examiner, AU 2872
January 22, 2005